7-05 MANHOLES, INLETS, CATCH BASINS, AND DRYWELLS

7-05.1 Description

This Work consists of constructing manholes, inlets, drywells, and catch basins and connecting to existing Structures of the types and sizes designated in accordance with the Plans, these Specifications, and the Standard Plans, in conformity with the lines and grades staked.

7-05.2 Materials

Materials shall meet the requirements of the following sections:

Concrete	6-02
Crushed Surfacing Base Course	9-03.9(3)
Gravel Backfill for Drywells	9-03.12(5)
Rubber Gaskets	9-04.4
Flexible Plastic Gaskets	9-04.5
Metal Castings	9-05.15
Grate Inlets and Drop Inlets	9-05.16
Reinforcing Steel	9-07
Concrete Blocks	9-12.1
Concrete Brick	9-12.2
Precast Concrete Manhole	9-12.4
Precast Concrete Catch Basins	9-12.5
Precast Concrete Drywells	9-12.7
Underground Drainage Geotextile, Moderate Survivability	9-33.1

7-05.3 Construction Requirements

The excavation for all manholes, inlets, and catch basins shall be sufficient to leave 1-foot in the clear between their outer surfaces and the earth bank.

The excavation for drywells shall be in accordance with the Standard Plans. The drywell and gravel backfill for drywell shall be completely encased in moderate survivability underground drainage geotextile in accordance with the Standard Plans and in conformance with Section 2-12.3. During construction of the drywell, all necessary precautions shall be taken to prevent debris and eroded material from entering the drywell.

The cover or grating of a manhole, catch basin, or inlet shall not be grouted to final grade until the final elevation of the pavement, gutter, ditch, or sidewalk in which it is to be placed has been established, and until permission thereafter is given by the Engineer to grout the cover or grating in place. Covers shall be seated properly to prevent rocking.

The channels in manholes shall conform accurately to the sewer grade.

Ladder rungs shall be grouted in the precast concrete walls. Rungs shall be uniformly spaced at 12-inches and be vertically aligned.

In the event any pipe enters the manhole through the precast concrete units, the Contractor shall make the necessary cut through the manhole wall and steel mesh. The steel shall be cut flush with the face of the concrete and shall be cut in such a manner that it will not loosen the reinforcement in the manhole wall.

The ends of all pipes shall be trimmed flush with the inside walls.

Rubber gaskets or flexible plastic gaskets may be used in tongue and groove joints of precast units. Joints between precast manhole units used for sanitary sewers shall be rubber gasketed. All other joints and all openings cut through the walls shall be grouted and watertight. Mortar shall conform to the requirements of Section 9-04.3.

If gaskets are used, handling of the precast units after the gasket has been affixed shall be done carefully to avoid disturbing or damaging the gasket or contaminating it with foreign material. Care shall be exercised to attain proper alignment before the joints are entirely forced home. During insertion of the tongue or spigot, the units shall be partially supported to minimize unequal lateral pressure on the gasket and to maintain concentricity until the gasket is properly positioned.

Rigid pipes connecting to sanitary sewer manholes shall be provided with a flexible joint at a distance from the face of the manhole of not more than 1½ times the nominal pipe diameter or 18-inches, whichever is greater.

Flexible pipes connecting to sanitary sewer manholes shall be provided with an entry coupling or gasket approved by the Engineer. No pipe joint in flexible pipe shall be placed within 10-feet of the manhole.

Backfilling around the Work will not be allowed until the concrete or mortar has thoroughly set.

Catch basins, manholes, and inlets shall be watertight.

Catch basin, grate inlet, and drop inlet connections to a sewer shall be so placed that the connecting pipe may be easily rodded over its entire length. After the connections are made, the Contractor shall rod all inlet and outlet pipes. All connections that cannot be successfully rodded shall be removed and new connections made.

Backfilling of manholes, inlets, catch basins, and drywells shall be done in accordance with the provisions of Section 2-09.

Manholes, catch basins, inlets, and drywells shall be constructed on a compacted or undisturbed level foundation. If the Contractor elects to use a separate cast-in-place base, the concrete shall be Class 4000. Upon final acceptance of the Work, all manholes, catch basins, inlets, drywells, and other drainage Structures shall conform to the requirements of the Standard Plan except as approved by the Engineer.

Any shoring or extra excavation required shall meet the requirements of Section 2-09.3.

7-05.3(1) Adjusting Manholes and Catch Basins to Grade

Where shown in the Plans or where directed by the Engineer, the existing manholes, catch basins, or inlets shall be adjusted to the grade as staked or otherwise designated by the Engineer.

The existing cast iron ring and cover on manholes and the catch basin and inlet frame and grate shall first be removed and thoroughly cleaned for reinstalling at the new elevation. From that point, the existing Structure shall be raised or lowered to the required elevation. The materials and method of construction shall conform to the requirements specified above, and the finished Structure shall conform to the requirements of the Standard Plan except as approved by the Engineer.

7-05.3(2) Abandon Existing Manholes

Where it is required that an existing manhole be abandoned, the Structure shall be broken down to a depth of at least 4-feet below the revised surface elevation, all connections plugged, and the manhole filled with sand and compacted to 90-percent density as specified in Section 2-03.3(14)C. Debris resulting from breaking the upper part of the manhole may be mixed with the sand subject to the approval of the Engineer. The ring and cover shall be salvaged and all other surplus material disposed of.

7-05.3(3) Connections to Existing Manholes

The Contractor shall verify invert elevations prior to construction. The crown elevation of laterals shall be the same as the crown elevation of the incoming pipe unless specified. The existing base shall be reshaped to provide a channel equivalent to that specified for a new manhole.

The Contractor shall excavate completely around the manhole to prevent unbalanced loading. The manhole shall be kept in operation at all times and the necessary precautions shall be taken to prevent debris or other material from entering the sewer, including a tight pipeline bypass through the existing channel if required. Water used for flushing and testing shall not be allowed to enter the sewer.

All damage to the manhole resulting from the Contractor's operation shall be repaired at no expense to the Contracting Agency.

7-05.3(4) Drop Manhole Connection

Drop manhole connections shall be constructed in accordance with the Plans. One length of ductile iron pipe shall be provided outside the manhole.

7-05.4 Measurement

Manholes will be measured per each. In addition to the measurement per each, manholes in excess of 10-feet in height will be measured per linear foot for each additional foot of height over 10-feet. Measurement of manhole heights for payment purposes will be the distance from the flow line of the outlet pipe to the top of the manhole ring measured to the nearest foot.

Catch basins and inlets, will be measured per each.

Adjustment of manholes, catch basins, and inlets will be per each.

Structure excavation Class B and Structure excavation Class B including haul will be measured by the cubic yard as specified in Section 2-09.

Abandon existing manholes will be measured per each.

Connections to existing drainage Structures will be measured per each.

Shoring or extra excavation will be measured as specified in Section 2-09.4.

Drop manhole connections will be measured per each.

Precast concrete drywell will be measured per each.

7-05.5 Payment

Payment will be made in accordance with Section 1-04.1, for each of the following Bid items that are included in the Proposal:

"Manhole ____ In. Diam. Type ____", per each.

"Manhole Additional Height ____ In. Diam. Type ____", per linear foot.

"Catch Basin Type ____", per each.

"Catch Basin Type 2 ____ In. Diam.", per each.

"Grate Inlet Type ____", per each.

"Drop Inlet Type ____", per each.

"Concrete Inlet", per each

All costs associated with furnishing and installing gravel backfill for bedding manholes, inlets and catch basins shall be included in the unit Contract price for the item installed.

"Precast Concrete Drywell", per each.

The unit Contract price per each for "Precast Concrete Drywell" shall be full pay for furnishing and installing the drywell, including all Structure excavation, gravel backfill for drywell, crushed surfacing base course, and drainage geotextile.

"Combination Inlet", per each.

All costs associated with furnishing and installing gravel backfill for bedding manholes, inlets, and catch basins shall be in the unit Contract price for the item installed.

"Adjust Manhole", per each.

"Adjust Catch Basin", per each.

"Adjust Inlet, per each.

The unit Contract price per each for "Adjust Manhole", "Adjust Catch Basin", or "Adjust Inlet" shall be full pay for all costs necessary to make the adjustment including restoration of adjacent areas in a manner acceptable to the Engineer.

"Structure Excavation Class B", per cubic yard.

"Structure Excavation Class B Incl. Haul", per cubic yard.

Structure excavation for concrete inlets is considered incidental to the cost of the inlets and shall be included in the unit Contract price for the concrete inlet.

"Abandon Existing Manhole", per each.

"Connection to Drainage Structure", per each.

"Shoring or Extra Excavation Class B", per square foot.

"Drop Manhole Connection", per each.

The price paid per drop connection is in addition to the price paid for manholes and for the specified sewer pipe that is replaced with ductile iron pipe.